


Worksheet 3.1 Special Pairs of Angles

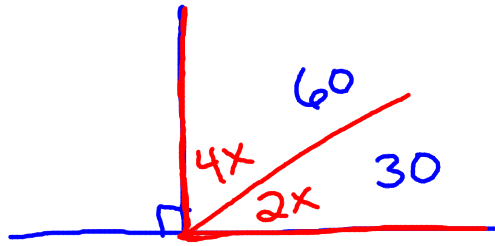
Classify each of the statements as true or false.

1. If two angles are complementary and congruent, each has a measure of 45° .
true
2. If two angles are congruent and supplementary, then each is a right angle.
true
3. Perpendicular lines form four right angles.
true
4. Two vertical angles may be complementary.
true 
5. If $m\angle 1 = 20$, $m\angle 2 = 40$, and $m\angle 3 = 50$, then the three angles are complementary.
false

Find the measure of a complement and a supplement of $\angle A$.

6. $m\angle A = 20$	7. $m\angle A = 75$	8. $m\angle A = 89$
C 70	15	1
S 160	105	91

9. Two complementary angles have measures in the ratio 2:4. What is the measure of the larger angle?

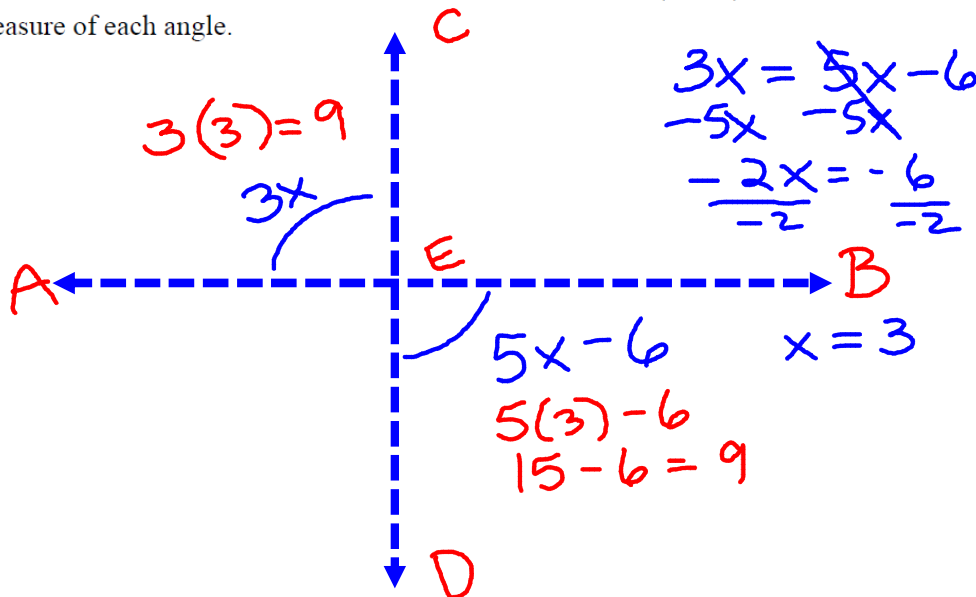


$$\begin{aligned} 6x &= 90 \\ \frac{6x}{6} &= \frac{90}{6} \\ x &= 15 \end{aligned}$$

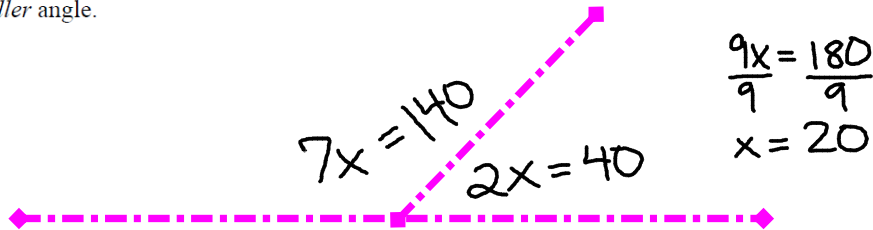
10. Two congruent angles are complementary. What is the measure of each angle?

45

11. If \overleftrightarrow{AB} and \overleftrightarrow{CD} intersect at E, $m\angle AEC = 3x$, and $m\angle BED = (5x - 6)$, find the value of x, and the measure of each angle.

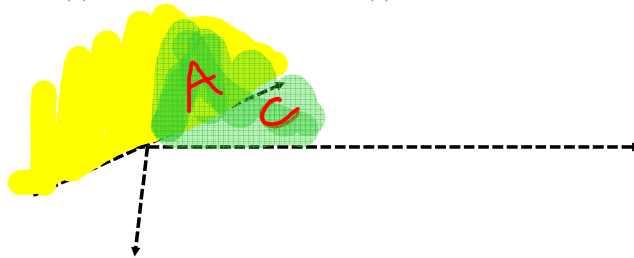


12. The measure of two supplementary angles are in the ratio 2:7. Find the measure of the *smaller* angle.

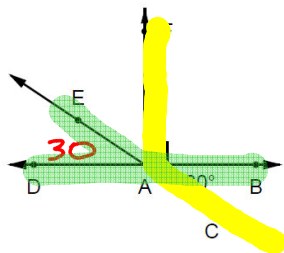


13. If $\angle C$ is the complement of $\angle A$, and $\angle S$ is the supplement of $\angle A$, which statement is always true?

- (a) $m\angle C > m\angle S$ (b) $m\angle C + m\angle S = 90$ (c) $m\angle C + m\angle S = 180$ (d) $m\angle C < m\angle S$



In the diagram below, \overleftrightarrow{DB} and \overleftrightarrow{EC} intersect at A. $\overleftrightarrow{AF} \perp \overleftrightarrow{DB}$, and $m\angle BAC = 30$.



14. Find the measure of $\angle EAD$.

30

15. Find the measure of $\angle FAC$.

120

16. $\angle DAE$ and $\angle EAF$ may be classified as what kind of special angles?

complementary

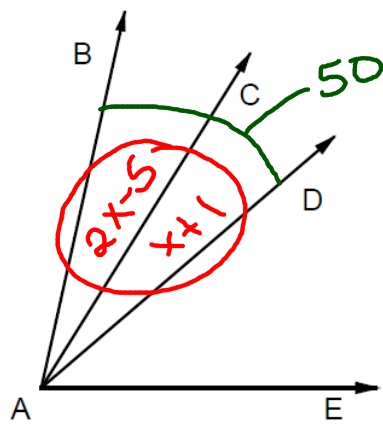
17. What is the sum of $m\angle DAE$ and $m\angle EAB$?

180

18. Find the measure of $\angle BAE$.

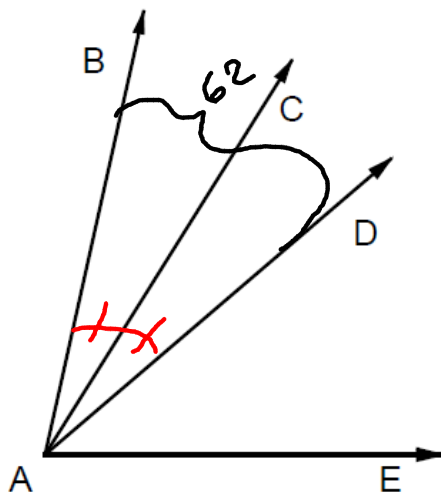
150

Questions 19 - 22 refer to the following.



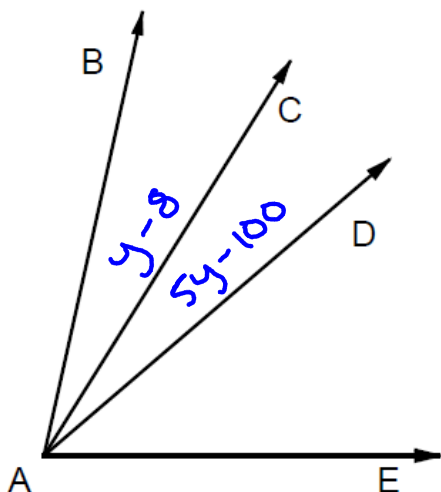
$$\begin{aligned} 3x - 4 &= 50 \\ +4 &+4 \\ \hline 3x &= 54 \\ \frac{3x}{3} &= \frac{54}{3} \\ x &= 18 \end{aligned}$$

19. If $m\angle BAC = (2x - 5)$, $m\angle CAD = (x + 1)$, and $m\angle BAD = 50$, find the value of x .



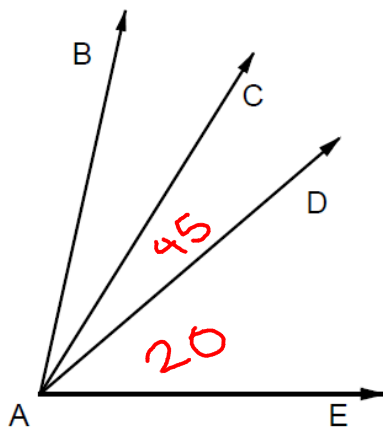
$$\frac{62}{2} = 31$$

20. If \overrightarrow{AC} bisects $\angle BAD$ and $m\angle BAD = 62$, find $m\angle BAC$.



$$\begin{aligned}
 y - 8 &= 5y - 100 \\
 -y &\quad -y \\
 -8 &= 4y - 100 \\
 +100 &\quad +100 \\
 92 &= 4y \\
 \frac{92}{4} &= \frac{4y}{4} \\
 23 &= y
 \end{aligned}$$

21. If \overrightarrow{AC} bisects $\angle BAD$, $m\angle BAC = (y - 8)$, and $m\angle CAD = (5y - 100)$, find the value of y .



$$20 + 45 = 65$$

22. If $m\angle EAD = 20$ and $m\angle DAC = 45$, find $m\angle EAC$.